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Nanded, Maharashtra, India.

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TAXONOMIC STUDIES OF SOME OF THE ASCOMYCETOUS FUNGI FROM LATUR DISTRICT.

Synopsis

For the Degree of Doctor of Philosophy in the faculty of Science and Technology.

By

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Introduction

The Ascomycetous fungi is the largest group. These fungi are highly diverse and versatile organisms adapted to all kinds of environment also they are heterogenous in nature and rich in their pattern.

However, it was observed that since during last few years Mycology a branch of Botany has been neglected in Marathwada region and no studies have been extensively done on this particular branch. Therefore, it was felt to undertake the work on the taxonomic study of the fungi.

To investigate fungal flora and to study their Taxonomic aspect the Latur district is selected. The Latur districtis located in Marathwada region which forms the part of Deccan plateau, in which the vegetation is with thorny shrubs mixed with different dry deciduous plants.

V.N. Naik has thoroughly investigated and recorded various Angiospermic plants. However as far as fungal flora is concerned some part of Marathwada region was remained totally unexplored. Therefore, it was intented to undertake the work of investigating various fungi occurring saprophytically on the dead and decaying fallen leaves and twigs of the plants from Latur district, particulary to investigate ascomyceteous fungi.

Dr. S.T.Tilak (1960-1975) who initiated the work on ascomycetous fungi from Maharashtra perticuraly Marathwada region. The great contribution on taxonomic studies of fungi of several workers like Arnold (1925), Arx and Muller (1954), Miller (1928-1949), Munk (1956), Mundkur (1938), Gill, Munjal and Kapoor (1961), Tilak (1960-1975) from India and from Marathwada region RamchandraRao (1963-1974), Kale (1965-1975) Srinivasulu (1967-1974), Jadhav (1972-1974), Talde (1972-1974), Gaikwad (1974),Dhaware (1976-1999), has been fully taken into account.

Review of Literature

Ascomycetes is a very large group of fungi growing in diverse habitats. These fungi are highly heterogenous in nature, have posed a difficult task to the Taxonomists. The Classification and taxonomy of Ascomycetous fungi and the pattern of the treatment of different groups by different workers are widely divergent depending upon their concept of

origin of these fungi and evolutionary characters of the various Taxonomic criteria, orders and sub-classes.

The modern trends in classification is greatly influenced by the work of several workers like Arnold (1925), Arx and Muller (1954) Dennis (1960), Hansford (1946) Kobayashi (1970), Luttrell (1951, 1957), Miller (1928, 1949), Munk (1956), Nannfeldt (1932), Orton (1924), Petrak (1923), Tilak (1975), Van Hoehnel (1919), Wehmeyer (1926) who have contributed much in the understanding this group.

With regards the work about Indian Ascomycetes, mention must be made of Cunningham (1866), Buller (1911), Umar (1938), de Mello (1939), Mundkur (1938), Gill, Munjal, Chona and Kapoor (1961), Muller (1957-1960), Tilak (1960-1975), Bose (1962-1974), Rao (1963-1974) and Kale (1965-1974).

However, the work on Ascomycetes from Marathwada region was neglected until Tilak (1960-1976) RamchandraRao (1963-1974), Kale (1966-1975), Srinivasulu (1967-1974) Jadhav (1972-1974), Talde (1972-1974) Gaikwad (1972-1974), Dhaware (1976) Mogarkar (1980) Khot (1985), Nagpurne (2003), Kamble (2007), Dhaware (2008)made valuable contribution to the Ascomycetes from this region Tilak (1960-1976), RamchandraRao (1963- onwards). Kale (1965-onwards),Talde (1974-onwords),Dhaware (1980-onwards) have published and recorded number of new species of which several constitutes new generic records to india.

Sivansan, Talde and Tilak (1974) erected a new genus BitrimonosporaSivansanet.al. Even today number of interior forests,in Maharashtra remained unexplored providing a scope for new workers in the field of Mycology.

Objectives of Research

1. Taxonomic study will provide an updated information to the students and researchers.
2. To develop a scientific attitude among the researchers.
3. To develop an ability to work on their own and to make them expert.
4. To develop ability to the researchers for identifying different fungi growing under the diverse conditions.

Materials and Methods

The collection of infected plant parts and their observation in the field itself is the first step in identifying the organism. For the collection of Ascomycetes, bundles of envelops, plastic bags or the paper slips and tags are the essential equipment, for the fungi growing on the different substrate like dead stems, leaves and branches. Collectioncan be made for every week or fortnightly during the study period. Mention, may be made that when we go slowly and carefully, we get more collections. During this period, Ascomycetes showed seasonal periodicity for their fruitifications. Especially, Helotiales and Hypo creals develops, rapidly during the rainy seasons. Several fungi discharge their spores by even a spell of shower. In Sphaeriales, Dothidiales and Hysteriales, the fruiting body is very tough and generally develops at the end of the rainy season. It is quite natural that, one has to collect the same material frequently so as to obtain the matured asci and ascospores.

The collection will be made from different places of Latur district. While collecting these ascomycetes, habit and fruitification relation of the same fungus with the same substratum, type of ascocarp, opening, presence or absence of neck, colour and appendages were noted in the field only with the help of triple magnifier lens. Special care would be taken to note down the name of the host, date and month of the collection, locality on the envelops or on paper slips tied to the materials. While noting the name of the host, often, difficulties arose as the fallen plant parts did not belong to the plant under which they were lying. For this, the morphological features like colour, odour, type of the wood and nature of the bark with the practical experience, helped a lot in identifuing the hosts. Many times, the help of common lay men for the vernacular name of infected plants which enabled us to indentify the host quickly.

After the field trips, the collections, can be brought to the Laboratory. Hand sections would be taken first, later on these can be mounted first in water so as to observe the true colour, nature of Asci, paraphyses and ascospores. This medium gives the truest colour. Then the hand sections would be mounted in Lactophenol. The stain cotton-blue was used in case of the fungus, having hyaline ascospores. To observe the ascus tip or the apical apparatus, the iodine was used. Melzer's reagent was frequently used to study the ascus tip. Blue reaction of the apical apparatus suggests the inoperculate nature and it is useful criteria for separating the inoperculate and operculate. The blue reaction is due to the

cellulose or starch in the apical apparatus. This reaction has helped in the separation of Helotiales from Pezizales and Sphaerialesfrom Loculoascomycetes. It usually gives yellowish brown colour to the non-gelatinisedhyphal walls and so helpful to decide if thin septa are present in ascospores, or whether the appearance of septal is due to the large vacuoles in apposition. Cotton blue was found to be useful in detecting the septation in the hyaline ascospores.

The sections mounted in Lactophenol on a glass slide can be carefully preserved by putting coverslips. The mount was gently warmed to make the fungal tissues swell to their natural size and appearance. These coverslips can be sealed carefully by a nail paint. Thus the slides can be preserved.

All the collected material with their number would be deposited in the Botany Research Laboratory, Shivaji Mahavidyalaya, Udgir, Dist.Latur (Maharashtra).

General Stains

1) Lactophenol

Phenol, Glycerine, Lactic acid and distilled water in equal parts by weight.

Phenol (Acid Carbolic)	---------- 100 grams
Glycerine	---------- 100 grams
Lactic acid	---------- 100 grams
Distilled water	---------- 100 ml

2) Cotton – Blue

Cotton blue or Anniline blue is dissolved in 100 cc of Lactophenol

Cotton- blue or Anniline blue	---------- 0.05 grams
Lactophenol	---------- 100 cc

3) Melzer's Solution

Potassium iodine	---------- 1.5 grams
Iodine	---------- 0.5 grams
Distilled water	---------- 20.0 cc
Chloral hydrate	---------- 20.0 cc

Importance of the study

Ascomycetes is a very large group of fungi growing in diverse habitats, with the richness of their pattern and highly heterogenous in nature, which have posed a difficult task to the Taxonomist.

However, it was observed that since during last few years mycology, a branch of Botany has been neglected from Marathwada region and no studies have been extensively studied on this particular branch. therefore ,it was felt to undertake the work on the taxonomic study of fungi.

The study of Ascomycetous fungi would be helpful in identifying the different causal organisms of the different diseases of the plants, particularly crop plants.

Proposed Work Plan

The research work would be completed through following steps.

1) Collection of infected plant material
2) Laboratory work
3) Identification of fungi

1) The collection of infected plant material would be done for continuous two years from different parts of Latur district. The field observation will be carefully done and the date of collection & identification of host, external morphological symptoms would be carefully recorded in the field note book.
2) In the Laboratory, after taking the hand sections of these infected plant materials the slides would be prepared and preserved in Laboratory carefully.
3) The preserved slides will be carefully observed under the caliberated research microscope. Then identification of different genera would be done with the help of book “Genera of Fungi” by Clements & Shear (1973).
4) After investigations of different fungi, at least one and half year will be required to collect the references and for writing work.

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